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Proctor

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(54) **ADJUSTABLE FOOT-REST CHAIR RING**

(75) Inventor: **Gerald Lynn Proctor**, Bryan, TX (US)

(73) Assignee: **Ergo Genesis, LLC**, Navasota, TX (US)

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A47C 7/50 (2006.01)

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USPC **297/423.1**; 297/423.38

(58) **Field of Classification Search**
USPC 297/423.18, 344.12, 423.1, 423.39, 297/423.38; 248/188.7, 188.8; D6/500, D6/375, 360
See application file for complete search history.

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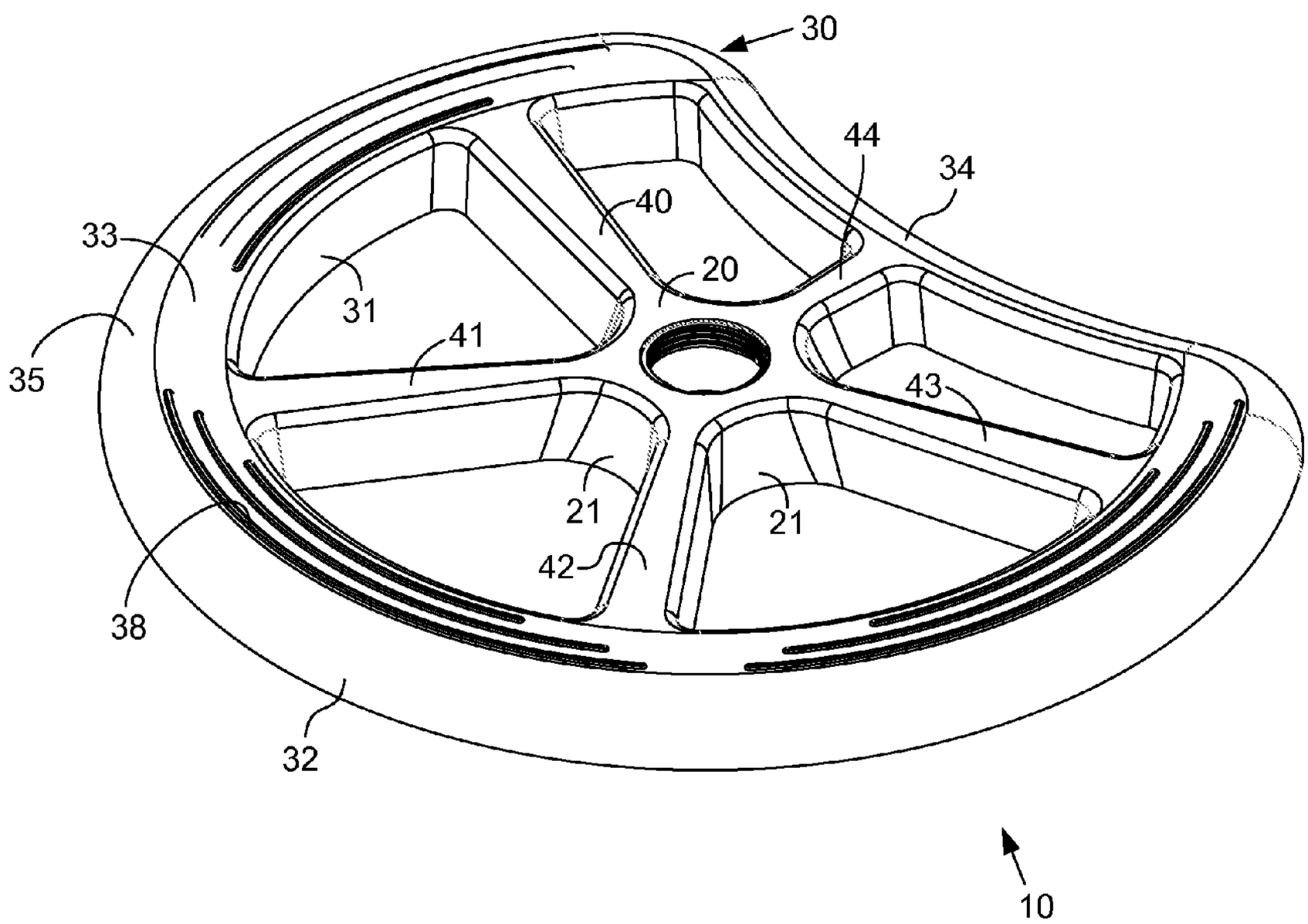
Primary Examiner — David Dunn
Assistant Examiner — Richard Lowry
(74) *Attorney, Agent, or Firm* — Eric W. Cernyar

(57) **ABSTRACT**

An ergonomic, rotatable foot-rest chair ring for an adjustable-height chair is provided. The chair ring comprises a rotation hub configured to be rotatably mounted on the seat post of an adjustable height chair and angularly displaced spokes extending radially from the rotation hub to a modified foot-supporting ring. The modified ring has a perimeter defined by a convex-ring-shaped section that extends more than half way around the hub and a recessed, concave arc section that completes the perimeter.

18 Claims, 5 Drawing Sheets



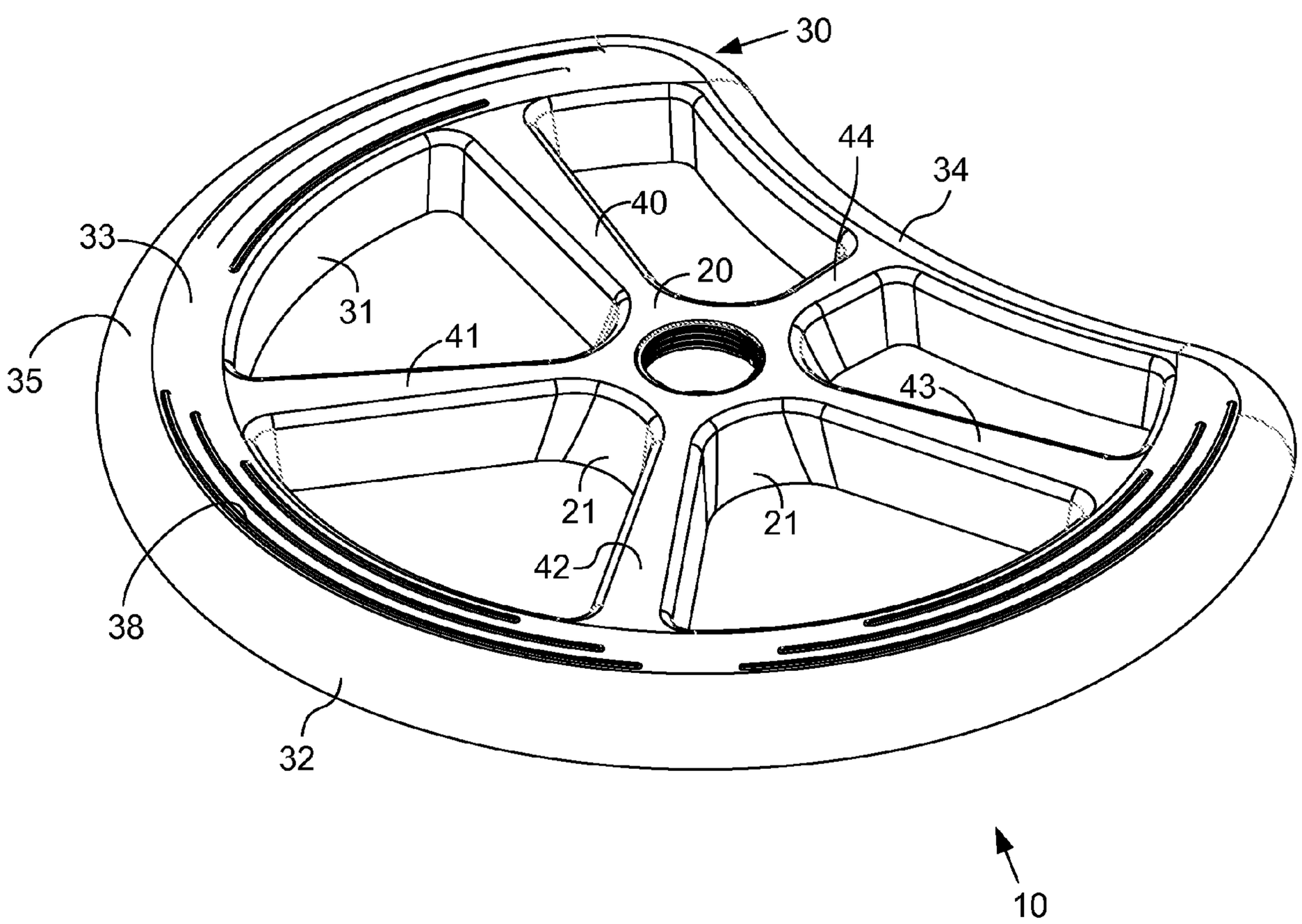


Fig. 1

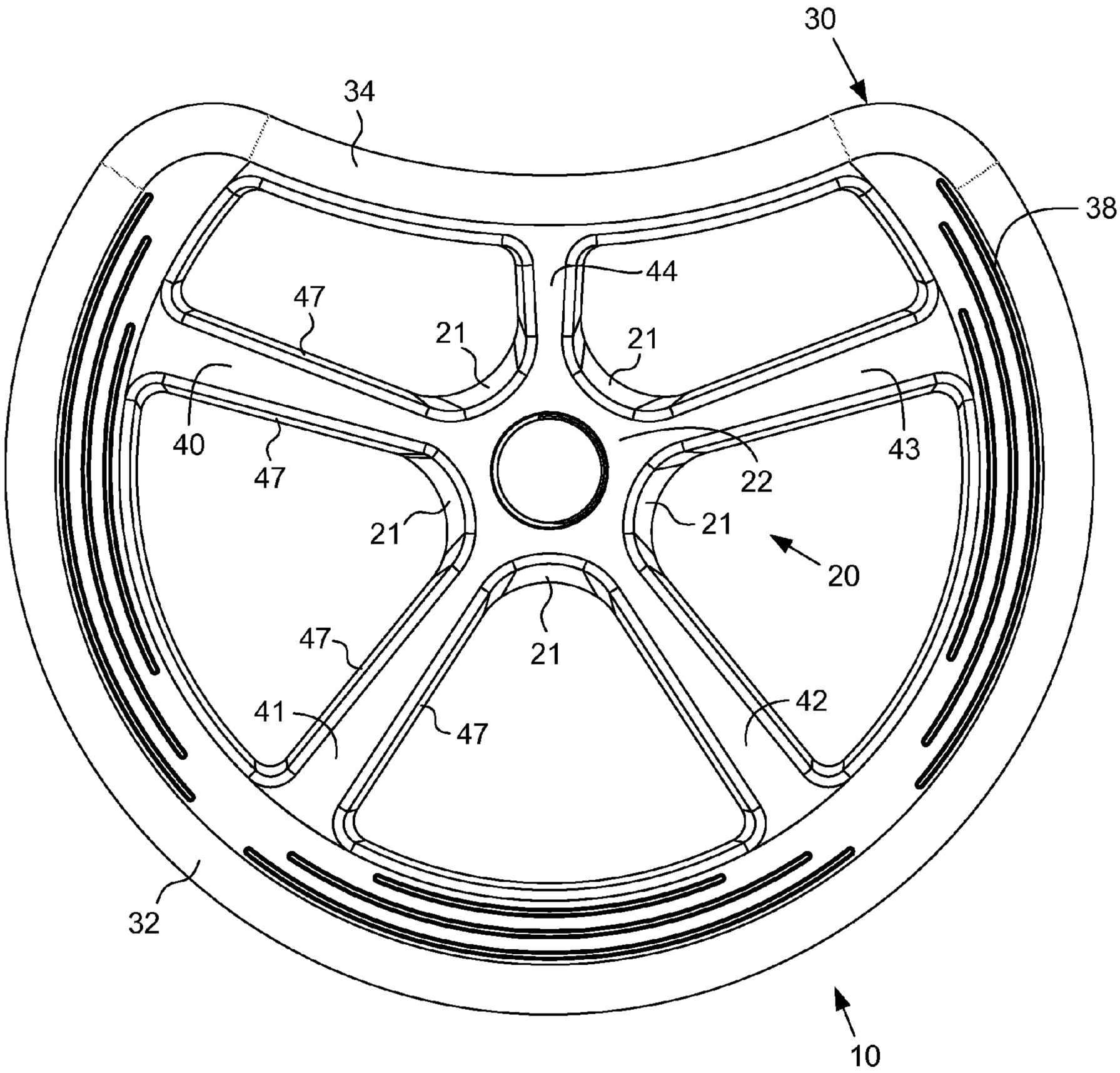


Fig. 2

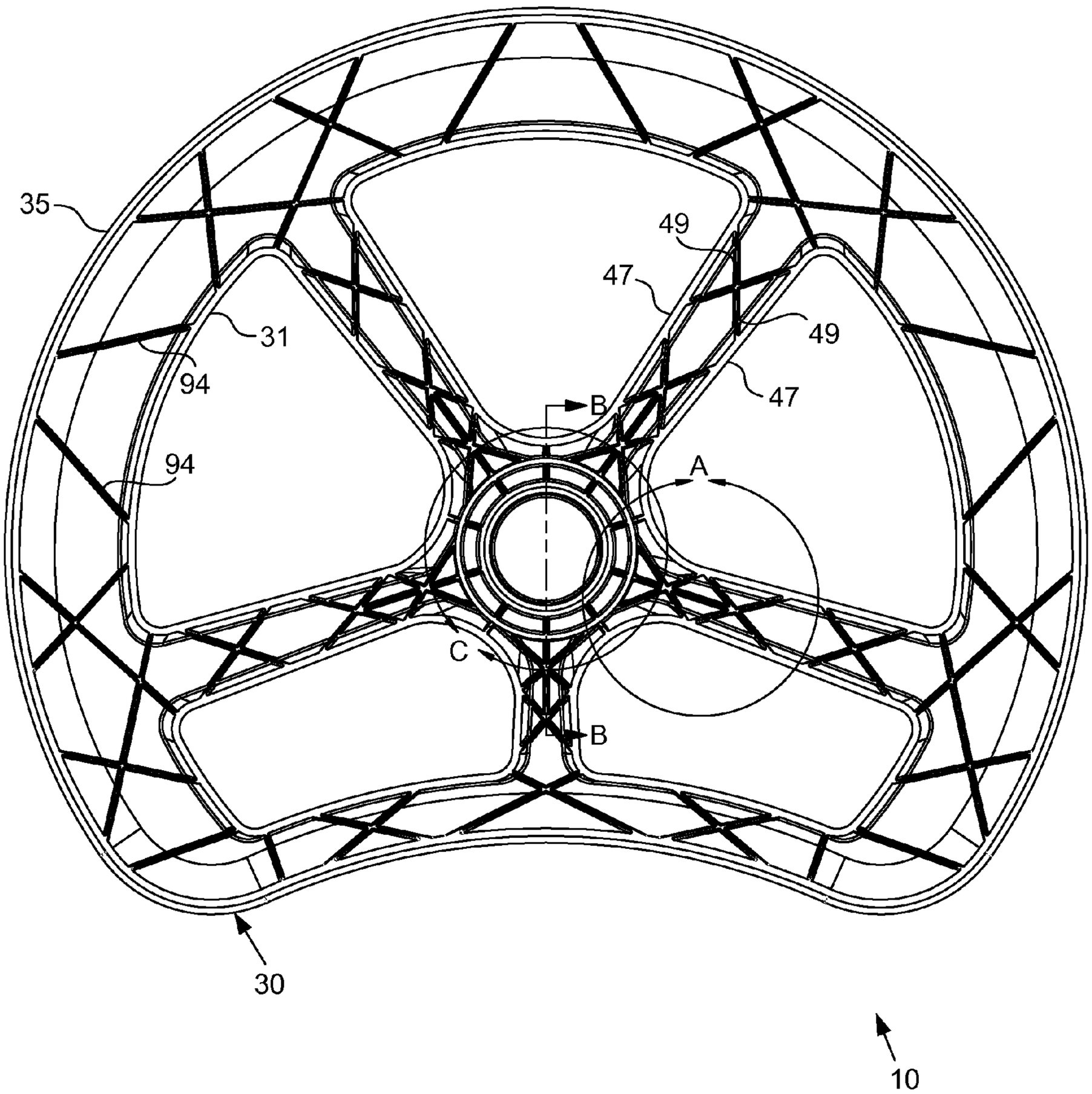


Fig. 3

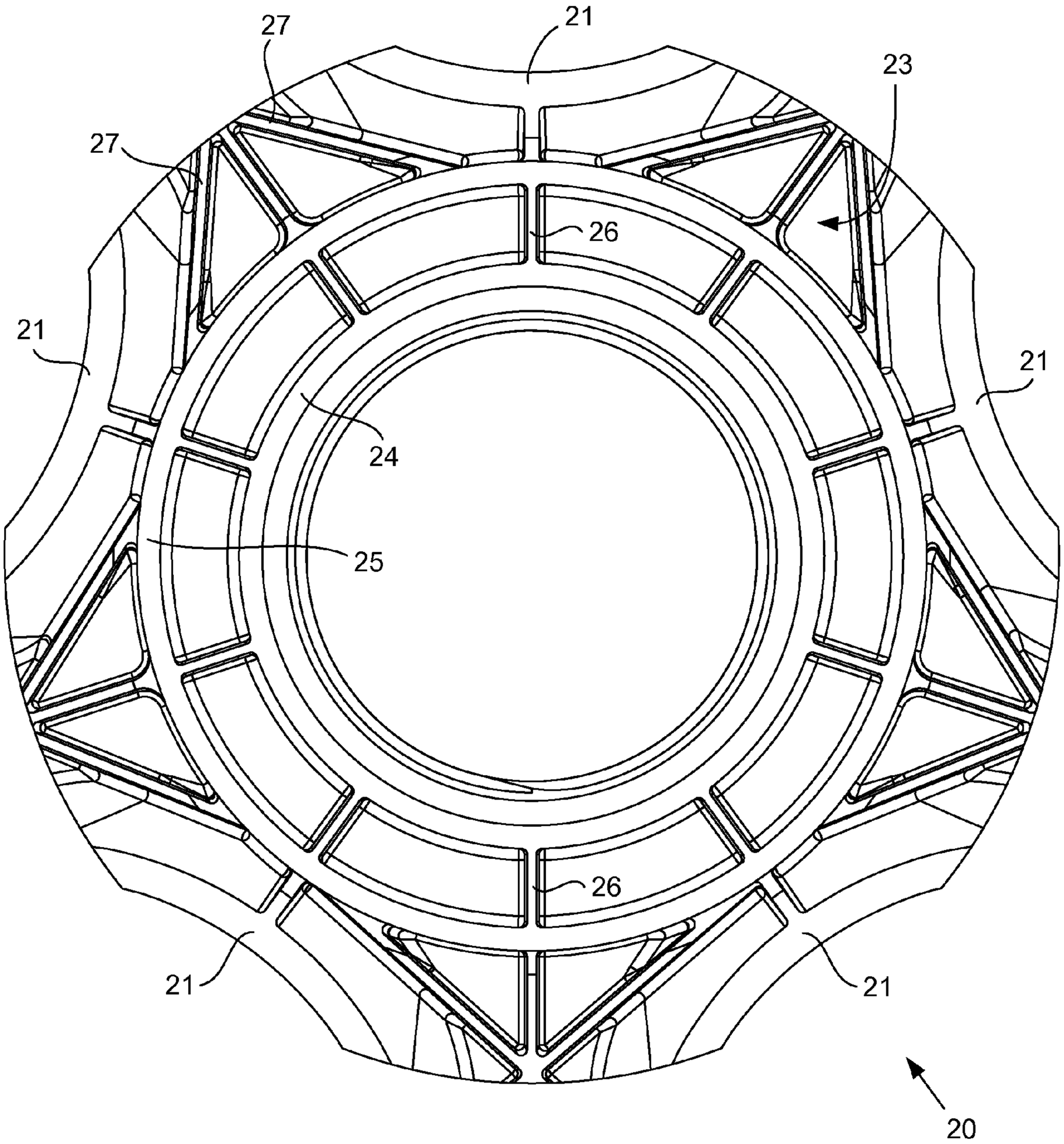


Fig. 4

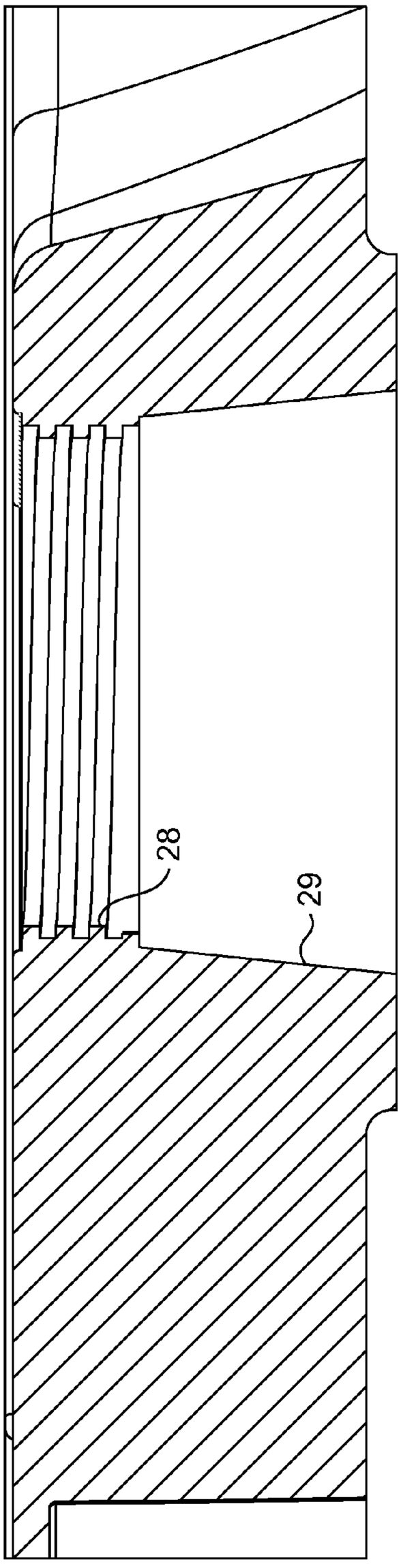


Fig. 5

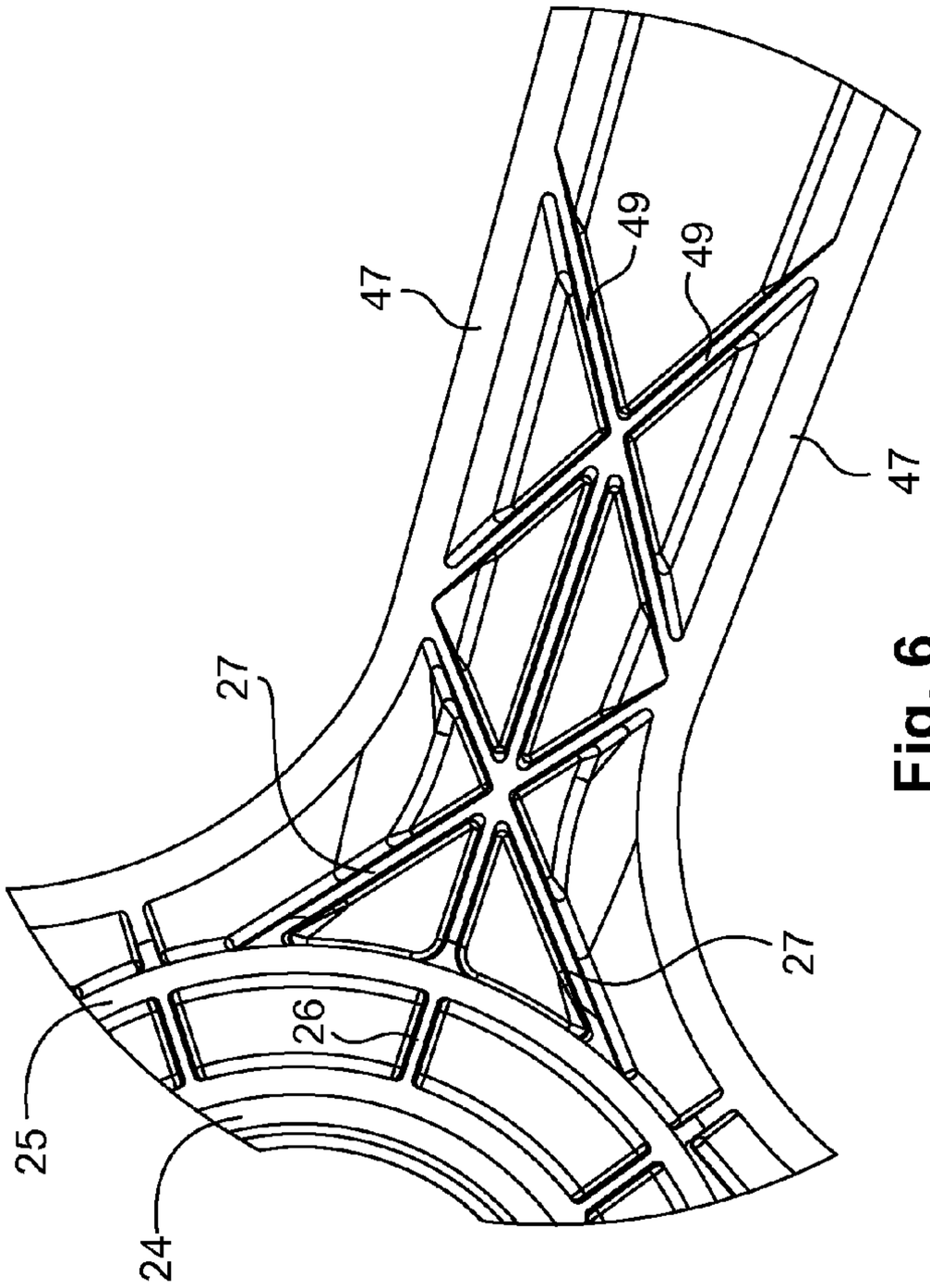


Fig. 6

ADJUSTABLE FOOT-REST CHAIR RING

FIELD OF THE INVENTION

This invention relates generally to adjustable-height chairs, and more particularly to foot rings for chairs.

BACKGROUND OF THE INVENTION

A conventional adjustable-height chair comprises a height-adjustable seat mounted to a post mounted to a base. Seats operable to be elevated a considerable height, for example, to the height of a conventional stool, frequently come with foot rests. Typically, however, the foot rests are circular and mounted in a fixed position with respect to the seat post. When the seat is lowered to a low height, for example, a desk-chair configuration, the foot rest obstructs a user from tucking his or her legs under the seat.

U.S. Pat. No. 5,836,555 to Ellsworth et al. discloses an industrial chair with radially extending legs to which are attached a plurality of vertically-stepped foot rests. Ellsworth et al. explains that once in a seated position, the user may select which of the footrests, which are configured at different heights, with which to support his/her legs. The footrests, however, are not designed to swivel around the seat post. U.S. Pat. No. 7,452,034 to Jung discloses a sector-shaped foot rest for a chair, but it also is not designed to swivel around the seat post. With these and similar designs, a user who adjusts the seat from a height for which a foot rest is desirable to one in which the foot rest is out of the way is faced with the cumbersome task of getting out of the chair to turn the chair base around or remove the foot rest from the chair.

SUMMARY OF THE INVENTION

An ergonomic, rotatable foot-rest chair ring for an adjustable-height chair is provided. The chair ring comprises a rotation hub configured to be rotatably mounted on the seat post of an adjustable height chair and angularly displaced spokes extending radially from the rotation hub to a modified foot-supporting ring. The modified ring has a perimeter defined by a convex-ring-shaped section that extends more than half way around the hub and a recessed, concave arc section that completes the perimeter. When the chair is positioned in a seat-elevated stool configuration, the chair ring is rotated to position the convex, ring-shaped section toward the front of the chair, in order to support the feet of a person sitting in the chair. When the chair is positioned in a seat-lowered desk configuration, the chair ring is rotated to position the recessed, concave arc section toward the front of the chair, in order to avoid obstruction of the legs of a person sitting in the chair.

In a more particular embodiment, the chair ring has five angularly displaced spokes, one of which is joined to the midpoint of the recessed, concave arc section. The other four spokes are joined, in a bilaterally symmetric way, to the convex, ring-shaped section, which extends approximately 240 degrees around the rotation hub. Each of the spokes has an isosceles-trapezoid-shaped cross section and gradually widens, like a widening light beam, from a narrow extent near the rotation hub to a wide extent near the modified ring.

The rotation hub itself is pentaradially symmetric, having a substantially pentagonal shape with concavely curved outer sidewalls. The outer sidewalls of the rotation hub also flare outwardly from top to bottom. The rotation hub comprises an inner collar with an interiorly-threaded top section and a conically tapered bottom section. The inner collar is joined by a plurality of ribs to an intermediately-positioned collar, which is, in turn, joined by those ribs to the curved and flared outer sidewalls.

To minimize weight, the chair ring has a substantially continuous top surface, substantially continuous side surfaces, and an open bottom. A plurality of intersecting, diagonally-oriented ribs extend between the sidewall structures of the chair ring, giving the chair ring considerable strength.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of one embodiment of a foot-rest chair ring.

FIG. **2** is a top view the foot-rest chair ring of FIG. **1**

FIG. **3** is a bottom view of the foot-rest chair ring of FIG. **1**.

FIG. **4** is an enlarged view of the section designated "A" in FIG. **3**.

FIG. **5** is a partial cross-sectional view taken along line B-B of FIG. **3**.

FIG. **6** is an enlarged view of the section designated "C" in FIG. **3**.

DETAILED DESCRIPTION

In describing preferred and alternate embodiments of the technology described herein, as illustrated in FIGS. **1-6**, specific terminology is employed for the sake of clarity. The technology described herein, however, is not intended to be limited to the specific terminology so selected, and it is to be understood that each specific element includes all structural equivalents that operate in a similar manner to accomplish similar functions.

FIGS. **1-6** illustrate one embodiment of a foot-rest chair ring **10** for an adjustable-height chair (not shown) with a seat operable to be raised and lowered between an elevated stool configuration and a relatively lower desk configuration. The illustrated foot-rest chair ring **10** is suitable for a wide variety of adjustable chairs with a center support seat post or pedestal.

The foot-rest chair ring comprises a rotation hub **20** configured to be rotatably mounted onto a seat post of an adjustable-height chair, a modified ring **30** surrounding the rotation hub **20**, and five angularly displaced spokes **40-44** extending radially from the rotation hub **20** to the modified ring **30**.

The modified ring **30** has a perimeter defined by a convex, ring shaped section **32** and a recessed, concave arc section **34**. The convex, ring-shaped section **32** extends more than 180 degrees (more particularly, in one embodiment, about 240 degrees) around the rotation hub **20**. The convex, ring-shaped section **32** is configured to support the feet of a person sitting in the chair when the chair is in the stool configuration. The convex, ring-shaped section **32** of the modified ring has a substantially cylinder-conforming inner sidewall **31**, a substantially planar top surface **33** with a non-slip molded top surface texture **38**, and a rounded outer sidewall **35**. The recessed, concave arc section **34** completes the perimeter and is configured to avoid obstruction of the legs of a person sitting in the chair when the chair is in the desk configuration. As the concave arc section **34** is not used to support the feet, it has a narrower width than the convex, ring-shaped section **32**. The concave arc section **34** also has a radius that is substantially greater than the radius of the convex, ring-shaped section **32**.

Each of the spokes **40-44** extends radially from the rotation hub **20** to the modified ring **30**. Each of the spokes **40-44** is distributed 72 degrees apart, relative to each other. Each of the spokes **40-44** has a cross section shaped substantially like an

isosceles trapezoid (with rounded top corners), which widens from a narrow extent near the rotation hub **20** to a wide extent near the modified ring **30**. One of the spokes, spoke **44**, is shorter than the other spokes **40-43**, and joins the recessed, concave arc section **34** of the modified ring **30** at the midpoint of the recessed, concave arc section **34**. The other four spokes **40-43** are of equal length.

The rotation hub **20** is pentaradially symmetric, having a substantially pentagonal shape with concavely curved outer sidewalls **21**. The rotation hub **20** also has a closed, planar top side **22** and an open bottom **23** (FIG. **4**). As shown most clearly in FIGS. **1** and **2**, the outer sidewalls **21** flare outwardly from top to bottom, giving the top side **22** of the rotation hub **20** a somewhat nested appearance, relative to the perimeter defined by the hub's bottom **23**. As seen best in FIG. **4**, the rotation hub **20** structurally comprises an inner collar **24** joined by radially-aligned ribs **26** to an intermediately-positioned collar **25** and the outer sidewalls **21** of the rotation hub **20**. As best seen in FIG. **6**, a plurality of diagonally-oriented ribs **27** couple the intermediately-positioned collar **25** to the trapezoidally-tapered sidewalls **47** of the spokes **40-44**. Turning to FIG. **5**, the inner collar **24** is defined by an interiorly threaded cylindrical top section **28** and a conically-tapered bottom section **29**. The threads enable the chair ring **10** to swivel about the seat post of an adjustable-height chair. Other mechanisms for coupling the chair ring **10** to the seat post, including configurations that enable vertical adjustment of the chair ring **10** with respect to the seat post, are also contemplated and within the scope of the invention.

Like the rotation hub **20**, the modified ring **30** and spokes **40-44** have an open bottom. A plurality of intersecting, diagonally-oriented ribs **94** extend between the inner sidewall **31** and rounded outer sidewall **35** of the modified ring **20**. Likewise, a plurality of intersecting, diagonally-oriented ribs **49** extend between opposite sidewalls **47** of the spokes. This structural pattern facilitates a light-weight yet strong design for the chair ring **10**.

Although no complete chair is illustrated in the drawings, the present invention also extends to the combination of an adjustable-height chair with a foot-rest chair ring designed in accordance with the present invention.

The foregoing specific details describe various embodiments of the invention, but persons reasonably skilled in the art will recognize that various changes may be made in the details of the apparatus or method of this invention without departing from the spirit and scope of the invention as defined in the appended claims. The present invention includes several independently meritorious inventive aspects and advantages. Unless compelled by the claim language itself, the claims should not be construed to be limited to structures that incorporate all of the inventive aspects, or enjoy all of the advantages, disclosed herein.

I claim:

1. A foot-rest chair ring for an adjustable-height chair with a seat operable to raised and lowered between a stool configuration and a desk configuration, the foot-rest chair ring comprising:

a rotation hub configured to be rotatably mounted onto a seat post of the adjustable-height chair;

a modified ring surrounding the rotation hub; and

angularly displaced spokes extending radially from the rotation hub to the modified ring;

wherein the modified ring has a perimeter defined by:

(a) a convex, ring-shaped section that extends more than 180 degrees around the hub and is configured to support the feet of a person sitting in the chair when the chair is in the stool configuration; and

(b) a recessed, concave arc section that completes the perimeter and is configured to avoid obstruction of the legs of a person sitting in the chair when the chair is in the desk configuration; and

wherein one of the spokes joins the recessed, concave arc section of the modified ring at a midpoint of the recessed, concave arc section.

2. The foot-rest chair ring of claim **1**, wherein five angularly displaced spokes extend radially from the rotation hub to the modified ring.

3. The foot-rest chair ring of claim **2**, wherein the rotation hub is pentaradially symmetric.

4. The foot-rest chair ring of claim **3**, wherein the rotation hub has a substantially pentagonal shape.

5. The foot-rest chair ring of claim **4**, wherein the outer sidewalls of the rotation hub flare outwardly from top to bottom.

6. The foot-rest chair ring of claim **2**, wherein each of the spokes widens from a narrow extent near the rotation hub to a wide extent near the modified ring.

7. The foot-rest chair ring of claim **6**, wherein each of the spokes has a cross-section shaped substantially like an isosceles trapezoid.

8. The foot-rest chair ring of claim **2**, wherein the convex, ring-shaped section of the modified ring extends approximately 240 degrees around the hub.

9. The foot-rest chair ring of claim **8**, wherein the convex, ring-shaped section of the modified ring has a substantially cylinder-conforming inner sidewall, a substantially planar top surface, and a rounded outer sidewall.

10. An adjustable-height chair comprising:

a seat post;

a seat mounted on the seat post and operable to be raised and lowered between a stool configuration and a desk configuration;

a foot-rest chair ring comprising:

a rotation hub rotatably mounted onto the seat post of the adjustable-height chair;

a modified ring surrounding the rotation hub; and

angularly displaced spokes extending radially from the rotation hub to the modified ring;

wherein the modified ring has a perimeter defined by:

(a) a convex, ring-shaped section that extends more than 180 degrees around the hub and is configured to support the feet of a person sitting in the chair when the chair is in the stool configuration; and

(b) a recessed, concave arc section that completes the perimeter and is configured to avoid obstruction of the legs of a person sitting in the chair when the chair is in the desk configuration; and

wherein one of the spokes joins the recessed, concave arc section of the modified ring at a midpoint of the recessed, concave arc section.

11. The adjustable-height chair of claim **10**, wherein five angularly displaced spokes extend radially from the rotation hub to the modified ring.

12. The adjustable-height chair of claim **11**, wherein the rotation hub is pentaradially symmetric.

13. The adjustable-height chair of claim **12**, wherein the rotation hub has a substantially pentagonal shape.

14. The adjustable-height chair of claim **13**, wherein the outer sidewalls of the rotation hub flare outwardly from top to bottom.

15. The adjustable-height chair of claim **11**, wherein each of the spokes widens from a narrow extent near the rotation hub to a wide extent near the modified ring.

16. The adjustable-height chair of claim **15**, wherein each of the spokes has a cross-section shaped substantially like an isosceles trapezoid.

17. The adjustable-height chair of claim **11**, wherein the convex, ring-shaped section of the modified ring extends approximately 240 degrees around the hub.

18. The adjustable-height chair of claim **17**, wherein the convex, ring-shaped section of the modified ring has a substantially cylinder-conforming inner sidewall, a substantially planar top surface, and a rounded outer sidewall.

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